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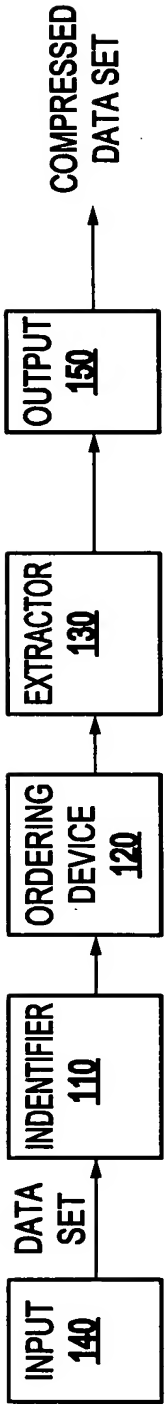


FIG.1

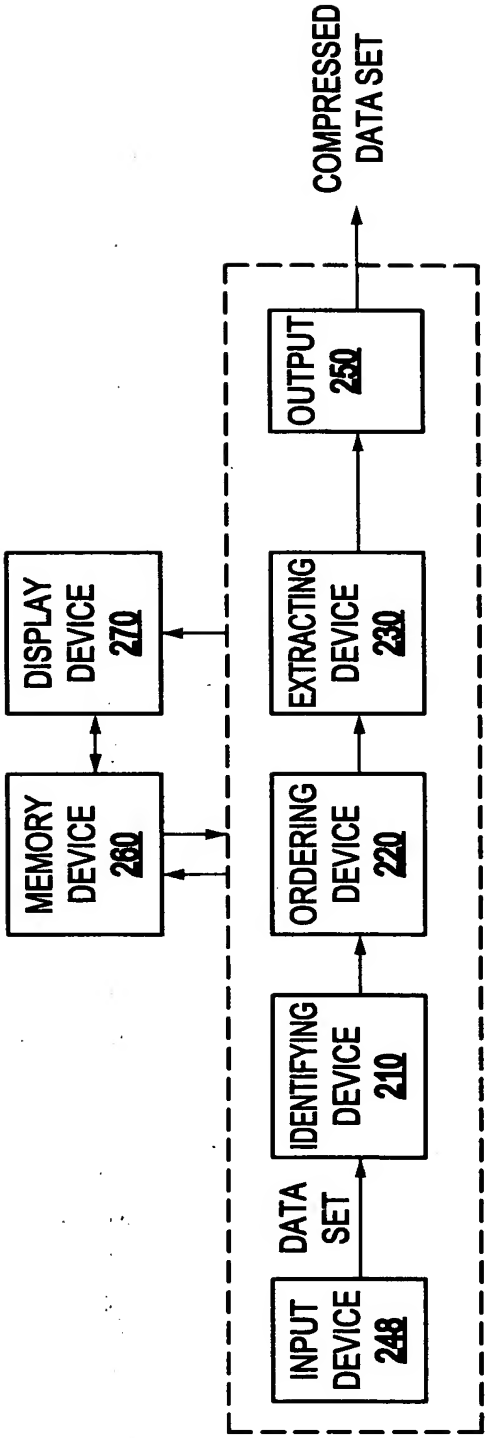
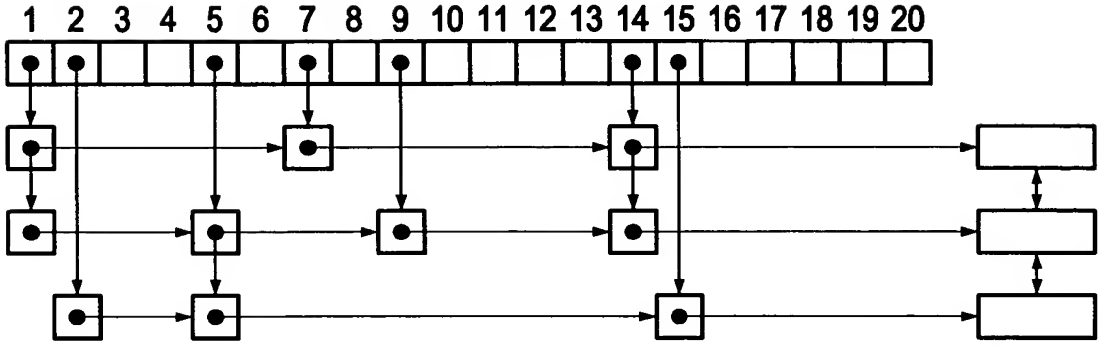


FIG.2

	1	2	3	4	5
m_1	a	b	c	.	d
m_2	a	b	e		
m_3	a	d	d	.	d
m_4	a	d	.	.	e
m_5	a	b	a	.	d

FIG.3



THREADING MOTIFS AND THEIR OCCURRENCES

FIG.4

LOSSY COMPRESSION OF GRAY-SCALE IMAGES (1 PIXEL = 1 BYTE)

FILE	FILE LEN	GZIP LEN [%COMPR]	$CODEC_2$ [%COMPR]	$CODEC_1$ [%COMPR]	%DIFF GZIP	%LOSS	';'/ CHAR
BRIDGE	66336	$61657_{[7.05]}$	$60987_{[8.06]}$	$57655_{[13.08]}$	6.49	0.42	1/4
			$60987_{[8.06]}$	$50656_{[23.63]}$	17.84	14.29	1/3
CAMERA	66336	$48750_{[26.51]}$	$47842_{[27.88]}$	$46192_{[30.36]}$	5.25	0.74	1/6
			$48044_{[27.57]}$	$45882_{[30.83]}$	5.88	2.17	1/5
			$47316_{[28.67]}$	$43096_{[35.03]}$	11.60	9.09	1/4
LENA	292944	$234543_{[12.10]}$	$226844_{[13.73]}$	$210786_{[19.83]}$	10.13	4.17	1/4
			$186359_{[29.13]}$	$175126_{[33.39]}$	25.33	20.00	1/3
PEPPERS	262944	$232334_{[11.64]}$	$218175_{[17.03]}$	$199605_{[23.85]}$	14.09	6.25	1/4
			$180783_{[31.25]}$	$173561_{[33.99]}$	25.30	20.00	1/3

FIG.5

LOSSY COMPRESSION OF BINARY IMAGES

FILE	FILE LEN	GZIP LEN [%COMPR]	$CODEC_2$ [%COMPR]	$CODEC_1$ [%COMPR]	%DIFF GZIP	%LOSS	','/ CHAR
CCITT7	513229	$109612_{[78.64]}$	$98076_{[80.89]}$	$91399_{[82.19]}$	16.62	16.67	1/5
			$93055_{[81.87]}$	$90873_{[82.29]}$	17.10	16.67	1/4
			$92658_{[81.95]}$	$85391_{[83.36]}$	22.10	25.00	1/3
TEST4	279213	$58736_{[78.96]}$	$57995_{[79.23]}$	$54651_{[80.42]}$	6.95	0.91	1/4
			$57714_{[79.32]}$	$54402_{[80.51]}$	7.38	1.27	1/3

FIG.6

LOSSY COMPRESSION OF MUSIC (1 SAMPLE = 1 BYTE)

FILE	FILE LEN	GZIP LEN [%COMPR]	$CODEC_2$ [%COMPR]	$CODEC_1$ [%COMPR]	%DIFF GZIP	%LOSS	','/ CHAR
CROWD	128900	$103834_{[19.44]}$	$92283_{[28.41]}$	$86340_{[33.01]}$	16.85	16.67	1/3
ECLIPSE	196834	$171846_{[12.96]}$	$148880_{[24.36]}$	$139308_{[29.22]}$	18.93	9.09	1/4
			$114709_{[41.72]}$	$111058_{[43.57]}$	35.37	25.00	1/3

FIG.7

LOSSY VS. LOSSLESS PERFORMANCE

FILE	FILE LEN	GZIP [%COMPR]	$CODEC_1$ [%COMPR]	%LOSS	','/ CHAR	LOSSLESS [%COMPR]	%DIFF GZIP
BRIDGE	66336	$61657_{[7.05]}$	$50656_{[23.63]}$	14.29	1/3	$59344_{[10.54]}$	3.75
CAMERA	66336	$48750_{[26.51]}$	$43096_{[35.03]}$	9.09	1/4	$45756_{[31.02]}$	6.14
LENA	262944	$234543_{[12.10]}$	$175126_{[33.39]}$	20.00	1/3	$199635_{[24.07]}$	14.88
PEPPERS	262944	$232334_{[11.64]}$	$199605_{[23.85]}$	6.25	1/4	$211497_{[19.56]}$	8.97
			$173561_{[33.99]}$	20.00	1/3	$195744_{[25.55]}$	15.75
CCITT7	513229	$109612_{[78.64]}$	$90873_{[82.29]}$	16.67	1/4	$97757_{[80.09]}$	10.82
			$85391_{[83.36]}$	25.00	1/3	$89305_{[82.59]}$	18.53
TEST4	279213	$58736_{[78.96]}$	$54402_{[80.51]}$	1.27	1/3	$54875_{[80.34]}$	6.57
CROWD	128900	$103834_{[19.44]}$	$86340_{[33.01]}$	16.67	1/3	$96903_{[24.82]}$	6.68
ECLIPSE	196834	$171846_{[12.96]}$	$139308_{[29.22]}$	9.09	1/4	$159206_{[19.11]}$	7.36
			$111058_{[43.57]}$	25.00	1/3	$151584_{[22.98]}$	11.97

FIG.8

LOSSLESS COMPRESSION OF CALGARY CORPUS

FILE	FILE LEN	GZIP [%COMPR]	$CODEC_1$ [%COMPR]	%LOSS	','/ CHAR	LOSSLESS [%COMPR]	%DIFF GZIP
BIB	111261	$35063_{[68.49]}$	$36325_{[67.35]}$	3.70	1/3	$37491_{[66.30]}$	6.92
BOOK1	768771	$313376_{[60.01]}$	$245856_{[68.01]}$	12.50	1/3	$277180_{[63.95]}$	11.55
BOOK2	610856	$206687_{[66.16]}$	$197199_{[67.72]}$	4.35	1/4	$202713_{[66.81]}$	1.92
GEO	102400	$68493_{[33.11]}$	$40027_{[60.91]}$	16.67	1/4	$63662_{[37.83]}$	7.05
NEWS	377109	$144840_{[61.59]}$	$144541_{[61.67]}$	0.42	1/3	$144644_{[61.64]}$	0.14
OBJ1	21504	$10323_{[51.99]}$	$8386_{[61.00]}$	16.67	2/5	$9221_{[57.12]}$	10.68
OBJ2	246814	$81631_{[66.93]}$	$71123_{[71.18]}$	20.00	1/2	$83035_{[66.36]}$	-1.72
PAPER1	53161	$18577_{[65.06]}$	$19924_{[62.52]}$	1.75	1/3	$20174_{[62.05]}$	-8.60
PAPER2	82199	$29753_{[63.80]}$	$29920_{[63.60]}$	0.76	1/2	$30219_{[63.24]}$	-1.57
PIC	513216	$56422_{[89.01]}$	$52229_{[89.82]}$	0.56	1/3	$52401_{[89.79]}$	7.13
PROGC	39611	$13275_{[66.49]}$	$13840_{[65.06]}$	1.32	1/2	$14140_{[64.30]}$	-6.52
PROGL	71646	$16273_{[77.29]}$	$17249_{[75.92]}$	0.58	1/3	$17355_{[75.78]}$	-6.65
PROGP	49379	$11246_{[77.23]}$	$12285_{[75.12]}$	0.64	1/3	$12427_{[74.83]}$	-10.50

FIG.9

LOSSLESS COMPRESSION OF SEQUENCES FROM DNA YEAST FAMILIES

FILE	FILE LEN	GZIP [%COMPR]	$CODEC_1$ [%COMPR]	%LOSS	',' / CHAR	LOSSLESS [%COMPR]	%DIFF GZIP
SPOR EARLYII	25008	$8008_{[67.98]}$	$6990_{[72.05]}$	0.45	1/3	$7052_{[71.80]}$	11.94
SPOR EARLYI	31039	$9862_{[68.23]}$	$8845_{[71.50]}$	0.36	1/3	$8914_{[71.28]}$	9.61
HELDEN CGN	32871	$10379_{[68.43]}$	$8582_{[73.89]}$	1.33	1/3	$8828_{[73.14]}$	14.94
SPOR MIDDLE	54325	$16395_{[69.82]}$	$14839_{[72.68]}$	0.36	1/4	$14924_{[72.53]}$	8.97
HELDEN ALL	112507	$33829_{[69.93]}$	$29471_{[73.81]}$	1.56	1/4	$29862_{[73.46]}$	11.73
SPOR ALL	222453	$68136_{[69.37]}$	$56323_{[74.68]}$	1.61	1/3	$57155_{[74.31]}$	16.12
ALL UP 400K	399615	$115023_{[71.22]}$	$93336_{[76.64]}$	14.29	1/3	$106909_{[73.25]}$	7.05

FIG.10

SYNOPSIS OF COMPRESSION RATES FOR SEQUENCES IN THE YEAST DNA BY VARIOUS LOSSLESS METHODS. THE FIGURE IN PARENTHESIS IS THE PERCENTAGE GAIN OF $CODEC_1$ VERSUS OTHER METHODS

FILE	FILE LEN	HUFFMAN PACK [%DIFF]	LZ-78 COMPRESS [%DIFF]	LZ-77 GZIP [%DIFF]	BWT GZIP [%DIFF]	$CODEC_1$ LOSSLESS
SPOR EARLYII	25008	$7996_{[13.4]}$	$7875_{[11.7]}$	$8008_{[13.6]}$	$7300_{[3.5]}$	7052
SPOR EARLYI	31039	$9937_{[11.5]}$	$9646_{[8.2]}$	$9862_{[10.6]}$	$9045_{[1.5]}$	8914
HELDEN CGN	32871	$10590_{[20.0]}$	$10223_{[15.8]}$	$10379_{[17.6]}$	$9530_{[8.0]}$	8828
SPOR MIDDLE	54325	$17295_{[15.9]}$	$16395_{[9.9]}$	$16395_{[9.9]}$	$15490_{[3.8]}$	14924
HELDEN ALL	112507	$36172_{[21.1]}$	$33440_{[12.0]}$	$33829_{[13.3]}$	$31793_{[6.5]}$	29862
SPOR ALL	222453	$70755_{[23.8]}$	$63939_{[11.9]}$	$68136_{[19.2]}$	$61674_{[7.9]}$	57155
ALL UP 400K	399615	$121700_{[13.8]}$	$115029_{[7.6]}$	$115023_{[7.6]}$	$112363_{[5.1]}$	106909

FIG.11

COMPRESSION, FIDELITY AND LOSS IN RECONSTRUCTION OF GREY SCALE IMAGES

FILE	FILE LEN	GZIP LEN [%COMPR]	$CODEC_1$ [%COMPR]	DIFF % GZIP	%LOSS	','/ CHAR	%LOSS PER PIXEL OVER RECON PIX	%LOSS PER PIXEL OVER ALL PIX
BRIDGE	66336	$61657_{[7.05]}$	$57655_{[13.08]}$	6.49	0.42	1/4	5.67	0.02
			$60987_{[8.06]}$	17.84	14.29	1/3	7.69	0.90
CAMERA	66336	$48750_{[26.51]}$	$47316_{[28.67]}$	11.60	9.09	1/4	0.78	0.05
LENA	262944	$234543_{[12.10]}$	$210786_{[19.83]}$	10.13	4.17	1/4	7.26	0.27
			$186359_{[29.13]}$	25.33	20.00	1/3	5.11	0.81
PEPPERS	262944	$232334_{[11.64]}$	$199605_{[23.85]}$	14.09	6.25	1/4	1.53	0.08
			$180783_{[31.25]}$	25.30	20.00	1/3	3.29	0.52

FIG.12

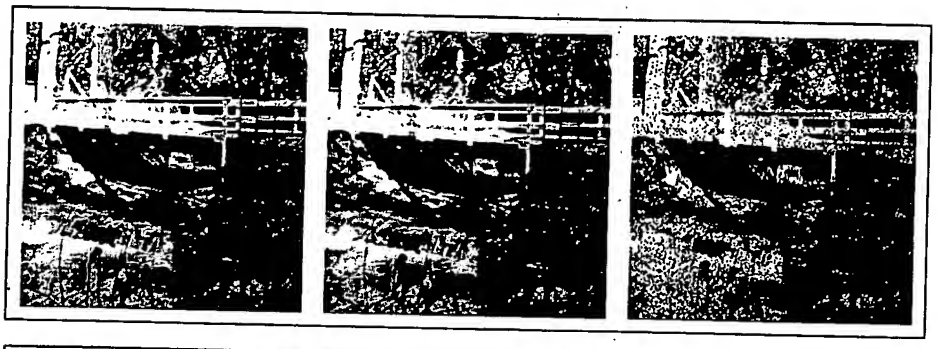


FIG.13A

FIG.13B

FIG.13C

FIG.13D

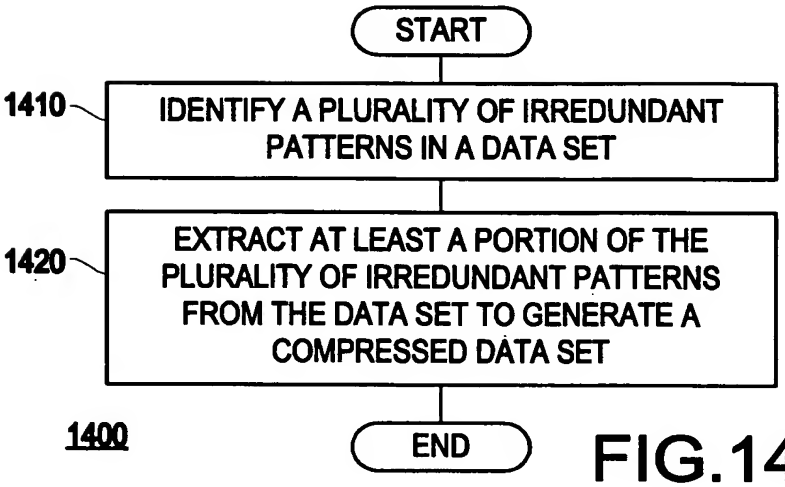


FIG.14

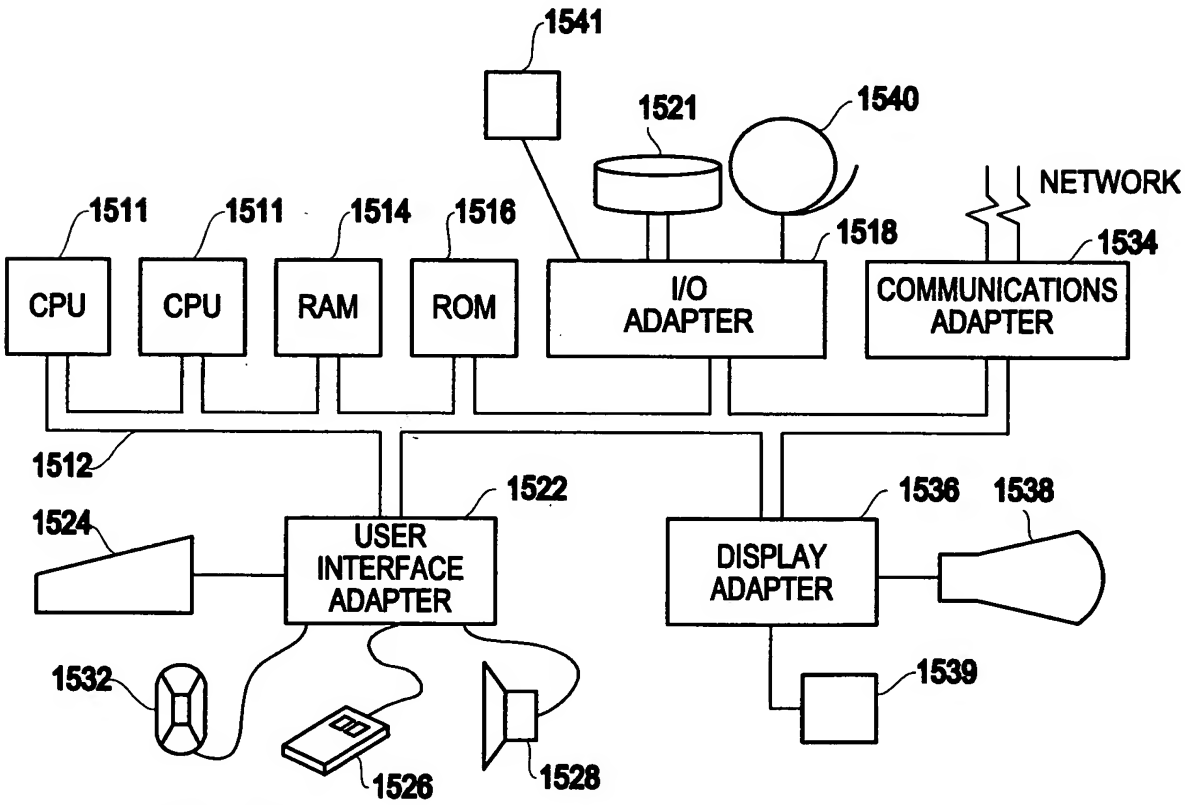


FIG.15

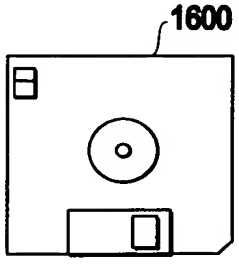


FIG.16

DESCRIPTION OF FARMER OAK – AN INCIDENT When Farmer Oak smile., the corners .f his mouth spread till the. were within an unimportant distance .f his ears, his eye. were reduced to chinks, and ...erging wrinklered round them, extending upon ... countenance li.e the rays in a rudimentary sketch of the rising sun. His Christian name was Gabriel, and on working days he was a young man of sound judgment, easy motions, proper dress, and ...eral good character. On Sundays, he was a man of misty views rather given to postponing, and .ampered by his best clotes and umbrella : upon ... whole, one who felt himself to occupy morally that ... middle space of Laodicean neutrality which ... between the Communion people of the parish and the drunken section, - that ... he went to church, but yawned privately by the t.ime the cong.egation reached the Nicene creed,- and thought of what there would be for dinner when he meant to be listening to the sermon.

DESCRIPTION OF FARMER OAK – AN INCIDENT When Farmer Oak smiled, the corners of his mouth spread till they were within an unimportant distance of his ears, his eyes were reduced to chinks, and diverging wrinkles round them, extending upon his countenance like the rays in a rudimentary sketch of the rising sun. His Christian name was Gabriel, and on working days he was a young man of sound judgment, each motions, proper dress, and general good character. On Sundays, he was a man of misty views, rather given to postponing, and hampered by his best clothes and umbrella : upon the whole, one who felt himself to occupy morally that vast middle space of Laodicean neutrality which lay between the Communion people of the parish and the drunken section, - that is, he went to church, but yawned privately by the time the congregation reached the Nicene creed,- and thought of what there would be for dinner when he meant to be listening to the sermon.

FIG.17